

WHAT WE CLAIM IS:

1. A volume hologram medium, wherein an image of a three-dimensional object and an image of a plane pattern are multi-recorded in a reflection hologram form by
5 interference of the same reference light beams having the same angle of incidence and the same wavelength with object light beams having mutually different angles of incidence.
2. The volume hologram medium according to claim
10 1, wherein a hologram of said image of a plane pattern is selectively recorded in only an area corresponding to said plane pattern and as a hologram comprising parallel interference fringes in one section at an angle with respect to at least a recording plane.
- 15 3. The volume hologram medium according to claim 2, wherein said section includes a normal to said recording plane, said hologram of said image of a plane pattern is recorded in such an angle relation that object light and reference light are incident on said recording
20 plane at substantially identical angles of incidence on the same side with respect to said normal to said recording plane and from mutually opposite directions between said recording plane is interposed, and a hologram of said image of a three-dimensional object is recorded in
25 such an angle relation that a center light ray of said object light is substantially vertically incident on said recording plane.
4. The volume hologram medium according to claim

2 or 3, wherein said hologram of said image of a plane pattern is recorded by interference of object light and reference light that diffuse in only a direction crossing at right angles with said section.

5 5. The volume hologram medium according to any one of claims 1 to 4, wherein said image of a plane pattern is an image of a painted design or micro-characters.

10 6. The volume hologram medium according to any one of claims 1 to 4, wherein said image of a plane pattern is an image of an array of lines or dots.

15 7. The volume hologram medium according to any one of claims 1 to 6, wherein at least one of said image of a three-dimensional object and said image of a plane pattern is multi-recorded at two or more different wavelengths.

 8. The volume hologram medium according to any one of claims 1 to 7, wherein a hologram photosensitive material comprises a photopolymer.

20 9. A volume hologram medium, wherein a plurality of plane pattern images are multi-recorded as a reflection hologram by interference of the same reference light beams having the same angle of incidence and the same wavelength with object light beams having mutually different angles
25 of incidence.

 10. The volume hologram medium according to claim 9, wherein an image of a three-dimensional object is multi-recorded by interference of reference light having

the same angle of incidence and wavelength as those of
said reference light used for recording said plurality of
plane pattern images with object light having an angle of
incidence different from that of said object light used
5 for recording to said plurality of plane pattern images.

11. The volume hologram medium according to claim
9 or 10, wherein each hologram of said plurality of plane
pattern images is selectively recorded in only an area
corresponding to each plane pattern, and as a hologram
10 comprising parallel interference fringes in one section at
an angle with respect to at least a recording plane.

12. The volume hologram medium according to any
one of claims 9 to 11, wherein said plurality of plane
pattern images comprise an image of the same plane pattern.

13. The volume hologram medium according to claim
11 or 12, wherein each hologram of said plurality of plane
pattern images is recorded by interference of object light
and reference light that diffuse in only a direction
crossing at right angles with said section.

14. The volume hologram medium according to any
one of claims 9 to 13, wherein said plurality of plane
pattern images are multi-recorded at two or more different
wavelengths.

15. A method for authentication of a volume
25 hologram medium having an image of a three-dimensional
object and an image of a plane pattern multi-recorded in a
reflection hologram form by interference of the same
reference light beams having the same angle of incidence

and the same wavelength with object light beams having mutually different angles of incidence, wherein:

an image of an array of lines or dots is recorded as said image of a plane pattern, and a pattern film on which
5 an array of lines or dots is drawn at the same pitch as that of said plane pattern comprising an array of lines or dots is brought in alignment with said volume hologram medium, so that said volume hologram medium can be authenticated with moiré fringes created between said
10 image of a plane pattern and a plane pattern comprising an array of lines or dots on said pattern film.

16. The method for authentication of a volume hologram medium according to claim 15, wherein said image of a plane pattern is recorded in such a way as to be re-
15 constructible near to a hologram plane of said volume hologram medium.